The documentation and process conversion measures necessary to comply with this revision shall be completed by 5 March 2004.

INCH-POUND

MIL-PRF-19500/609D
5 December 2003
SUPERSEDING
MIL-PRF-19500/609C
7 April 2000

* PERFORMANCE SPECIFICATION SHEET

* SEMICONDUCTOR DEVICE, DIODE, SILICON, SWITCHING,
TYPES 1N6639, 1N6640, 1N6641, 1N6639US, 1N6640US, AND 1N6641US,
JAN, JANTX, JANTXV, AND JANS

This specification is approved for use by all Departments and Agencies of the Department of Defense.

* The requirements for acquiring the product described herein shall consist of this specification sheet and MIL-PRF-19500.

1. SCOPE

* 1.1 Scope. This specification covers the performance requirements for controlled forward voltage switching diodes. Four levels of product assurance are provided for each device type as specified in MIL-PRF-19500.

* 1.2 Physical dimensions. See figure 1 (similar to DO-35) and figure 2 (US).

* 1.2.1 Mounting arrangement. See figure 3.

* 1.3 Maximum ratings. T_A = +25°C.

Types	V_{BR}	V_{RWM}	I_O (1)	I_{FSM} t_p= 1/120 s	T_{STG}, T_J	$R_{\theta JL}$ L = .375	$R_{\theta JEC}$ L = 0	$Z_{\theta JX}$
	V (pk)	V (pk)	mA	A (pk)	°C	°C/W	°C/W	°C/W
1N6639, 1N6639US	100	75	300	2.5	-65 to +200	150	40	25
1N6640, 1N6640US	75	50	300	2.5	-65 to +200	150	40	25
1N6641, 1N6641US	75	50	300	2.5	-65 to +200	150	40	25

(1) For derating, see figures 4, 5, 6, and 7.

Comments, suggestions, or questions on this document should be addressed to: Defense Supply Center, Columbus, ATTN: DSCC-VAC, P.O. Box 3990, Columbus, OH 43216-5000, or emailed to alan.barone@dla.mil.
Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at www.dodssp.daps.mil.

1.4 Primary electrical characteristics. Unless otherwise specified, primary electrical characteristics at T_A = +25°C.

Types	V_{F4} I_F = 200 mA (pulsed)	V_{F5} I_F = 500 mA (pulsed)	I_{R1} at T_A = +25°C $V_R = V_{RWM}$	I_{R2} at T_A = +150°C $V_R = V_{RWM}$	t_{fr} I_F = 200 mA	t_{rr} $I_{RM} = I_F$ = 10 mA	C_{T1} V_R = 0
	V dc	V dc	nA dc	µA dc	ns	ns	pF
1N6639, 1N6639US		1.2	100	90	10	4.0	2.5
1N6640, 1N6640US	1.0		100	90	10	4.0	2.5
1N6641, 1N6641US	1.1		100	90	10	5.0	3.0

2. APPLICABLE DOCUMENTS

* 2.1 General. The documents listed in this section are specified in sections 3, 4 or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3, 4 or 5 of this specification, whether or not they are listed.

2.2 Government documents.

* 2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATION

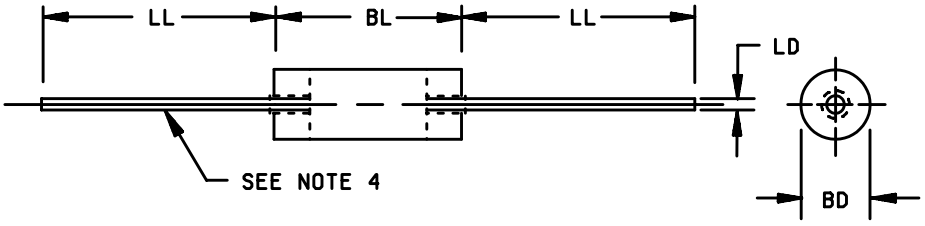
MIL-PRF-19500 - Semiconductor Devices, General Specification for.

DEPARTMENT OF DEFENSE STANDARD

MIL-STD-750 - Test Methods for Semiconductor Devices.

* (Copies of these documents are available online at http://assist.daps.dla.mil/quicksearch/ or www.dodssp.dap.mil or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

* 2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.



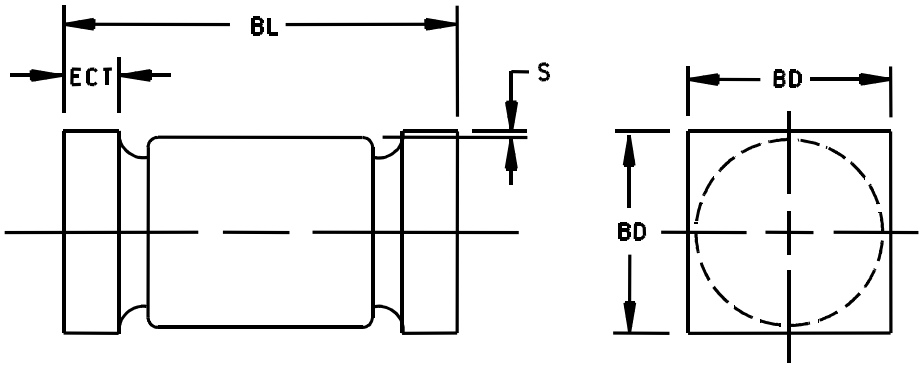
Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
BD	.056	.080	1.42	2.03	3, 4, 5
BL	.130	.180	3.30	4.57	3, 4
LD	.018	.022	0.46	0.56	4
LL	1.00	1.50	25.40	38.10	

Types 1N6639, 1N6640, and 1N6641.

* NOTES:

1. Dimensions are in inches
2. Millimeters are given for general information only.
3. The maximum dimension of BD shall apply for dimension BL.
4. The minimum dimension of BD shall apply over at least .065 inch (1.65 mm) of dimension BL.
5. The specified lead diameter applies in the zone between .050 inch (1.27 mm) from the diode body to the end of the lead. Outside of this zone lead shall not exceed BD.
6. Dimensions are in accordance with ASME Y14.5M.

FIGURE 1. Physical dimensions (DO-35).



Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BD	.070	.085	1.78	2.16
BL	.165	.195	4.19	4.95
ECT	.019	.028	0.48	0.71
S	.003		0.08	

Types 1N6639US, 1N6640US, and 1N6641US.

* FIGURE 2. Physical dimensions of surface mount (US).

3. REQUIREMENTS

* 3.1 General. The individual item requirements shall be as specified in MIL-PRF-19500 and as modified herein.

* 3.2 Qualification. Devices furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturer's list before contract award (see 4.2 and 6.3).

3.3 Abbreviations, symbols, and definitions. Abbreviations, symbols, and definitions used herein shall be as specified in MIL-PRF-19500.

* 3.4 Interface and physical dimensions. Interface and physical dimensions shall be as specified in MIL-PRF-19500 and on figure 1 and 2 herein.

* 3.4.1 Lead finish. Lead finish shall be solderable as defined in MIL-PRF-19500, MIL-STD-750, and herein. Where a choice of lead finish is desired, it shall be specified in the acquisition document (see 6.2).

3.4.2 Diode construction.

a. All devices shall be of metallurgically bonded, thermally matched, noncavity-double plug construction in accordance with the requirements of category I (see MIL-PRF-19500).

b. The 'US' version shall be structurally identical to the non-US versions except for end-cap lead attachment.

3.5 Marking. Marking shall be in accordance with MIL-PRF-19500.

* 3.5.1 Marking for 'US' devices. For 'US' version devices only, all marking may be omitted from the body (except for cathode band, see 3.6), but shall be retained on the initial container.

3.6 Polarity. Alternatively, the polarity of all types shall be indicated with a contrasting color band to denote the cathode end. For 'US' suffix devices a minimum of three contrasting color dots spaced around the cathode end of the device may be used.

3.7 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in 1.3, 1.4, and table I.

3.8 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table I herein.

3.9 Workmanship. Semiconductor devices shall be processed in such a manner as to be uniform in quality and shall be free from other defects that will affect life, serviceability, or appearance.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Qualification inspection (see 4.2).

b. Screening (see 4.3).

c. Conformance inspection (see 4.4).

4.2 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-19500.

* 4.2.1 Group E qualification. Group E qualification shall be performed herein for qualification or requalification only. In case qualification was awarded to a prior revision of the specification sheet that did not request the performance of table II tests, the tests specified in table II herein shall be performed by the first inspection lot to this revision to maintain qualification.

* 4.3 Screening (JANS, JANTXV and JANTX levels only). Screening shall be in accordance with table IV of MIL-PRF-19500, and as specified herein. Specified electrical measurements shall be made in accordance with table I herein. Devices that exceed the limits of table I herein shall not be acceptable.

Screen (see table IV of MIL-PRF-19500)	JANS level	JANTXV and JANTX level
1a 1b	Required Required	Not required Required (JANTXV only)
2	Not required	Not required
3a 3b (1) 3c	Required Not applicable Thermal impedance (see 4.3.2)	Required Not applicable Thermal impedance (see 4.3.2)
4	Not applicable	Not applicable
5	Not applicable	Not applicable
6	Not applicable	Not applicable
7a 7b	Not applicable Optional	Not applicable Optional
8	Required	Not required
9	I_{R1}	Not applicable
10	Method 1038 of MIL-STD-750, condition A	Method 1038 of MIL-STD-750, condition A
11	V_{F4} (1N6640, 1N6641) or V_{F5} (1N6639), I_{R1}; and $V_{(BR)}$; ΔI_{R1} $\pm$15 nA dc or 100 percent of initial value whichever is greater.	V_{F4} (1N6640, 1N6641) or V_{F5} (1N6639) and I_{R1}
12	Required, see 4.3.1	Required, see 4.3.1
13	Subgroups 2 and 3 of table I herein; $\Delta I_{R1} \leq$ 100 percent of initial reading or 15 nA dc, whichever is greater. $\Delta V_{F4} \leq \pm$ 0.030 V dc for 1N6640, 1N6641), $\Delta V_{F5} \leq \pm$ 0.030 V dc for 1N6639. Reverse scope display evaluation (see 4.5.3)	Subgroup 2 of table I herein; $\Delta I_{R1} \leq$ 100 percent of initial reading or 15 nA dc, whichever is greater. $\Delta V_{F4} \leq \pm$ 0.030 V dc for 1N6640, 1N6641), $\Delta V_{F5} \leq \pm$ 0.030 V dc for 1N6639. Reverse scope display evaluation (see 4.5.3)
14a 14b	Not applicable Required	Not applicable Required
15	Required	Not required
16	Required	Not required

(1) Thermal impedance shall be performed any time after screen 3.

* 4.3.1 Power burn-in conditions. Power burn-in conditions are as follows (see 4.5.1 and 4.5.5): Method 1038 of MIL-STD-750, condition B, T_A = room ambient as defined in 4.5 of MIL-STD-750. V_R = rated V_{RWM}; f = 50-60 Hz; I_O = 300 mA minimum. An alternative of I_F (dc) = 300 mA minimum may be used at T_A = room ambient as defined in 4.5 of MIL-STD-750. Adjust I_O or I_F to achieve T_J = 125°C minimum (see 4.5.5). Use method 3100, MIL-STD-750 to measure T_J.

* 4.3.2 Thermal impedance $Z_{\theta JX}$ measurements for screening. The $Z_{\theta JX}$ measurements shall be performed in accordance with method 3101 of MIL-STD-750. The maximum limit and conditions for $Z_{\theta JX}$ in screening (table IV of MIL-PRF-19500) shall be derived statistically by each vendor by means of actual measurements which characterize the die attach process (not to exceed the table I limit.)

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500.

* 4.4.1 Group A inspection. Group A inspection shall be conducted in accordance with table V of MIL-PRF-19500, table I herein, and as specified herein. Electrical measurements (end-points) shall be in accordance with table I, subgroup 2 herein. The following test conditions shall be used for $Z_{\theta JX}$, table I inspection.

a. I_H forward heating current .....1-2 A.

b. t_H heating time.....10 ms.

c. I_M measure current.....1 mA to 10 mA.

d. t_{MD} measurement delay time.....100 μs maximum.

The maximum limit for $Z_{\theta JX}$ under these test conditions is $Z_{\theta JX(max)}$ = 25°C/W.

* 4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in tables VIa (JANS) and VIb (JAN, JANTX, and JANTXV) of MIL-PRF-19500 and 4.4.2.1 and 4.4.2.2 herein. Electrical measurements (end-points) shall be in accordance with table I, subgroup 2.

* 4.4.2.1 Group B inspection, table VIa (JANS) of MIL-PRF-19500.

Subgroup	Method	Conditions
B3	1056	-55°C to 100°C, 100 cycles, n = 22, c = 0.
	1051	-55°C to 150°C, 25 cycles, n = 22, c = 0.
B4	1037	$V_{(pk)}$ = rated V_{RWM} = V_R, T_A = room ambient as defined in 4.5 of MIL-STD-750, f = 50-60 Hz (see 4.5.1); t_{on} = t_{off} = 1 minute minimum; 2,000 cycles; I_O = 300 mA maximum; In lieu of ac conditions, a dc condition of I_F = 400 mA may be used.
B5	1027	I_O = 300 mA minimum, V_R = rated V_{RWM}, f = 50-60 Hz (see 4.5.1).
		Option 1: Adjust I_O to obtain a minimum T_J of +275°C, t = 96 hours. $T_A \leq$ 100°C.
		Option 2: Adjust I_O to obtain a minimum T_J of +225°C, t = 216 hours, c = 0, n = 45, $T_A \leq$ 30°C.
		Option 3: Adjust I_O to obtain a minimum T_J of 200°C, t = 1,000 hours, c = 0, n = 45, $T_A \leq$ 30°C.

* 4.4.2.2 Group B inspection, table VIb (JAN, JANTX, and JANTXV) of MIL-PRF-19500.

Subgroup	Method	Condition
B2	1056	0°C to + 100°C, 10 cycles, n = 22, c = 0.
B2	1051	-55°C to + 175°C, 25 cycles, n = 22, c = 0.
B3	1027	T_A = room ambient as defined in 4.5 of MIL-STD-750; V (pk) = rated V_{RWM}; f = 50-60 Hz (see 4.5.1 and 4.5.5); I_O = 300 mA minimum dc; adjust I_O or T_A to obtain a minimum T_J of +150°C.
B6	1032	T_A = +175°C.

* 4.4.3 Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in table VII of MIL-PRF-19500. Electrical measurements (end-points) shall be in accordance with table I, subgroup 2.

Subgroup	Method	Condition
C2	1056	0°C to + 100°C, 10 cycles, n = 22, c = 0.
C2	1051	-55°C to + 175°C, 25 cycles, n = 22, c = 0.
C2	2036	Tension: Test condition A; weight 4 pounds, t = 15 seconds. Lead fatigue: Test condition E. NOTE: Not applicable for 'US' suffix types.
C5	3101	Thermal resistance, junction to lead. L = .375 inch (9.53 mm), $R_{\theta JL}$ = 150°C/W maximum; $R_{\theta JEC}$ = 40°C/W; (see 4.4.5 herein).
C6	1026	1,000 hours minimum at T_A = room ambient as defined in 4.5 of MIL-STD-750; V (pk) = rated V_{RWM}; f = 50-60 Hz (see 4.5.1 and 4.5.5); I_O = 300 mA minimum dc; adjust I_O or T_A to obtain a minimum T_J of +150°C.
C7	2031	n = 22, c = 0.

* 4.4.4 Group E inspection. Group E inspection shall be conducted in accordance with the conditions specified for subgroup testing in table IX of MIL-PRF-19500 and table II herein. Electrical measurements (end-points) shall be in accordance with table I, subgroup 2 herein.

* 4.4.5 Thermal resistance. Thermal resistance measurement shall be performed in accordance with method 3101 or 4081 of MIL-STD-750. Forced moving air or draft shall not be permitted across the devices during test. The maximum limit for $R_{\theta JL}$ under these test condition shall be $R_{\theta JL(max)}$ = 150°C/W and $R_{\theta JEC(max)}$ = 40°C/W. The following conditions shall apply:

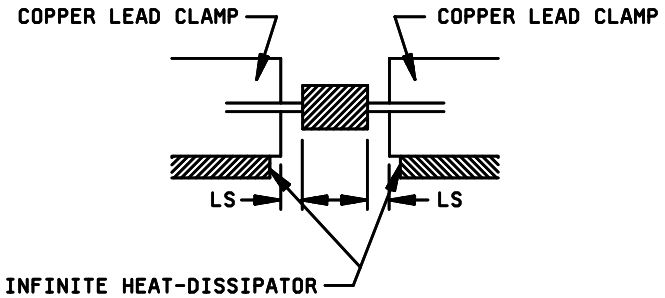
a. I_M = 1 mA to 10 mA.

b. I_H = 75 mA to 300 mA.

c. t_H = 25 seconds minimum.

d. t_{MD} = 100 μs maximum.

LS = Lead spacing = .375 inch (9.53 mm) for non-surface mount devices and 0 inch for surface mount devices as defined as follows:



* FIGURE 3. Mounting arrangement.

4.5 Methods of inspection. Methods of inspection shall be as specified in the appropriate tables and as follows.

4.5.1 Life test. These tests shall be conducted with a half-sine waveform of the specified peak voltage impressed across the diode in the reverse direction followed by a half-sine waveform of the specified average rectified current. The forward conduction angle of the rectified current shall be neither greater than 180 degrees, no less than 150 degrees.

4.5.2 Forward-recovery voltage and time. Forward recovery shall be measured as the time interval between zero time and the point where the pulse has decreased to 110 percent of the steady-state value of V_F when I_F = 200 mA dc. The maximum rise time of the response detector shall be 1 ns.

* 4.5.3 Scope display evaluation. Scope display evaluation shall be stable in accordance with method 4023 of MIL-STD-750. Scope display may be performed on ATE (Automatic Test Equipment) for screening only with the approval of the qualifying activity. Scope display in table I, subgroup 4 shall be performed on an oscilloscope. Reverse current (I_{BR}) over the knee shall be 100 μA peak.

* 4.5.4 Pulse measurements. Conditions for pulse measurements shall be as specified in section 4 of MIL-STD-750.

* 4.5.5 Free air burn-in. Deliberate heat sinking, baffles, or forced air cooling is prohibited unless otherwise approved by the qualifying activity. The use of a current limiting or ballast resistor is permitted provided that each DUT still sees the full P_t (minimum) and that the minimum applied voltage, where applicable, is maintained through out the burn-in period.

* TABLE I. Group A inspection

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
Subgroup 1						
Visual and mechanical examination	2071					
Subgroup 2						
Thermal impedance	3101	See 4.3.2	$Z_{\theta JX}$		25.0	◦C/W
Forward voltage (1N6640, 1N6640US only)	4011	I_F = 1 mA dc pulsed	V_{F1}	0.540	0.620	V dc
Forward voltage (1N6640, 1N6640US only)	4011	I_F = 50 mA dc pulsed	V_{F2}	0.760	0.860	V dc
Forward voltage (1N6640, 1N6640US only)	4011	I_F = 100 mA dc pulsed	V_{F3}	0.820	0.920	V dc
Forward voltage	4011	I_F = 200 mA dc pulsed	V_{F4}			
1N6640, 1N6640US				0.870	1.00	V dc
1N6641, 1N6641US				0.870	1.10	V dc
Forward voltage (1N6639, 1N6639US only)	4011	I_F = 500 mA dc pulsed	V_{F5}		1.20	V dc
Breakdown voltage	4021	$I_{(BR)}$ = 10 μA dc	V_{BR}			
1N6639, 1N6639US				100		V dc
1N6640, 1N6640US				75		V dc
1N6641, 1N6641US				75		V dc
Reverse current	4016	DC method;	I_{R1}			
1N6639, 1N6639US		V_R = 75 V dc			100	nA dc
1N6640, 1N6640US		V_R = 50 V dc			100	nA dc
1N6641, 1N6641US		V_R = 50 V dc			100	nA dc
Subgroup 3						
High temperature operation:		T_A = +150◦C				
Reverse current	4016	DC method	I_{R2}			
1N6639, 1N6639US		V_R = 75 V dc			90	μA dc
1N6640, 1N6640US		V_R = 50 V dc			90	μA dc
1N6641, 1N6641US		V_R = 50 V dc			90	μA dc
Low-temperature operation:		T_A = -55◦C				
Forward voltage	4011	Pulsed	V_{F6}			
1N6639, 1N6639US		I_F = 500 mA pulsed			1.3	V dc
1N6640, 1N6640US		I_F = 200 mA pulsed			1.1	V dc
1N6641, 1N6641US		I_F = 200 mA pulsed			1.2	V dc

See footnote at end of table.

* TABLE I. Group A inspection - Continued.

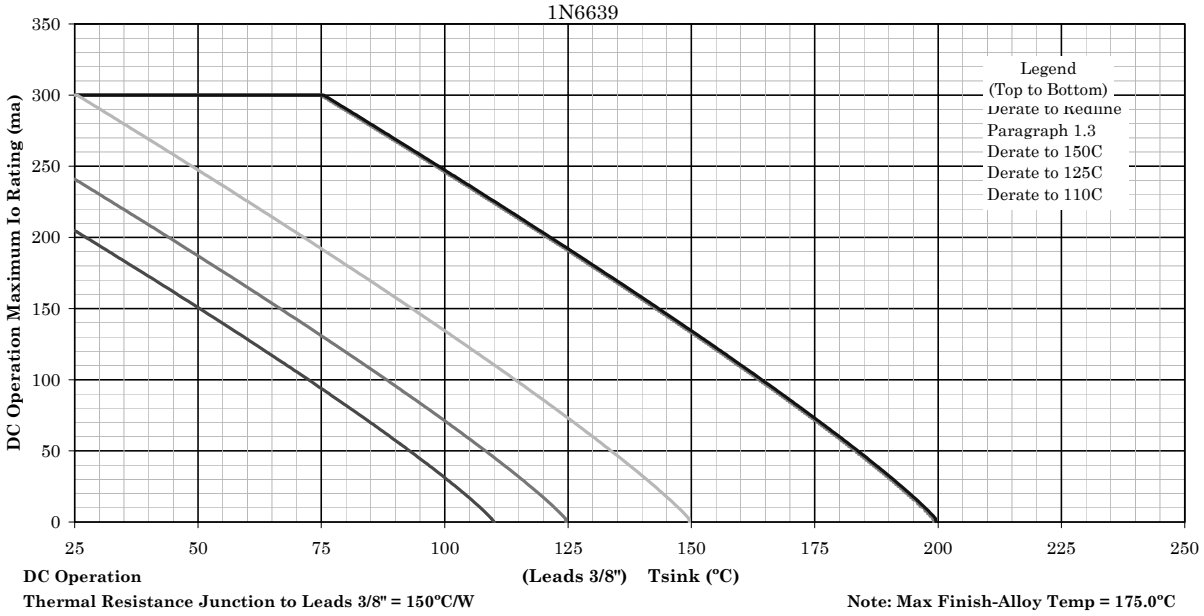
Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
Subgroup 4						
Capacitance	4001	V_R = 0 V dc; V_{sig} = 50 mV(p-p), f = 1 MHz	C_{T1}			
1N6639, 1N6639US					2.5	pF
1N6640, 1N6640US					2.5	pF
1N6641, 1N6641US					3.0	pF
Reverse recovery time	4031	Condition A, I_F = I_{RM} = 10 mA dc;	t_{rr}			
1N6639, 1N6639US					4.0	ns
1N6640, 1N6640US					4.0	ns
1N6641, 1N6641US					5.0	ns
Scope display	4023	Stable n = 116, c = 0				
Subgroup 5						
Not applicable						
Subgroup 6						
Surge current	4066	I_{FSM} = see 1.3; 10 surges at 1 per minute (maximum) surge; duration = 8.3 ms				
Electrical measurements		See table I, subgroup 2 herein.				
Subgroup 7						
Forward recovery voltage and time	4026	I_F = 200 mA dc (see 4.5.2)	V_{fr}		5.0	V(pk)
			t_{fr}		10.0	ns

1/ For sampling plan, see MIL-PRF-19500.

* TABLE II. Group E inspection (all quality levels) for qualification and requalification.

Inspection	MIL-STD-750		Qualification inspection
	Method	Conditions	
Subgroup 1			45 devices, c = 0
Thermal shock (glass strain)	1056	20 cycles, condition D except low temperature shall be achieved using liquid nitrogen (-195°C). A visual for cracked glass shall be performed.	
Temperature cycling	1051	500 cycles, condition C, -65°C to +175°C	
Hermetic seal	1071	Gross leak only	
Electrical measurement		See table I, subgroup 2	
Subgroup 2			45 devices, c = 0
Intermittent operating life	1037	10,000 cycles	
Electrical measurements		See table I, subgroup 2	
Subgroup 3			3 devices, c = 0
Destructive physical analysis		Cross section and scribe and break.	
Subgroup 4			
Thermal impedance curves		Each supplier shall submit their (typical) design thermal impedance curves to the qualifying activity. In addition, the optimal test conditions and $Z_{\theta JX}$ limit shall be provided to the qualifying activity in the qualification report	
Subgroup 5			15 devices, c = 0
Potted environment test	1054		
Subgroup 6			3 devices c =0
ESD	1020		
Subgroup 7			45 devices c = 0
Resistance to glass cracking	1057	Test to destruction or 25 cycles max whichever comes first.	
Subgroup 8			45 devices
Soldering heat	2031	1 cycle	
Electrical measurement		See table I, subgroup 2	

Temperature-Current Derating Curves

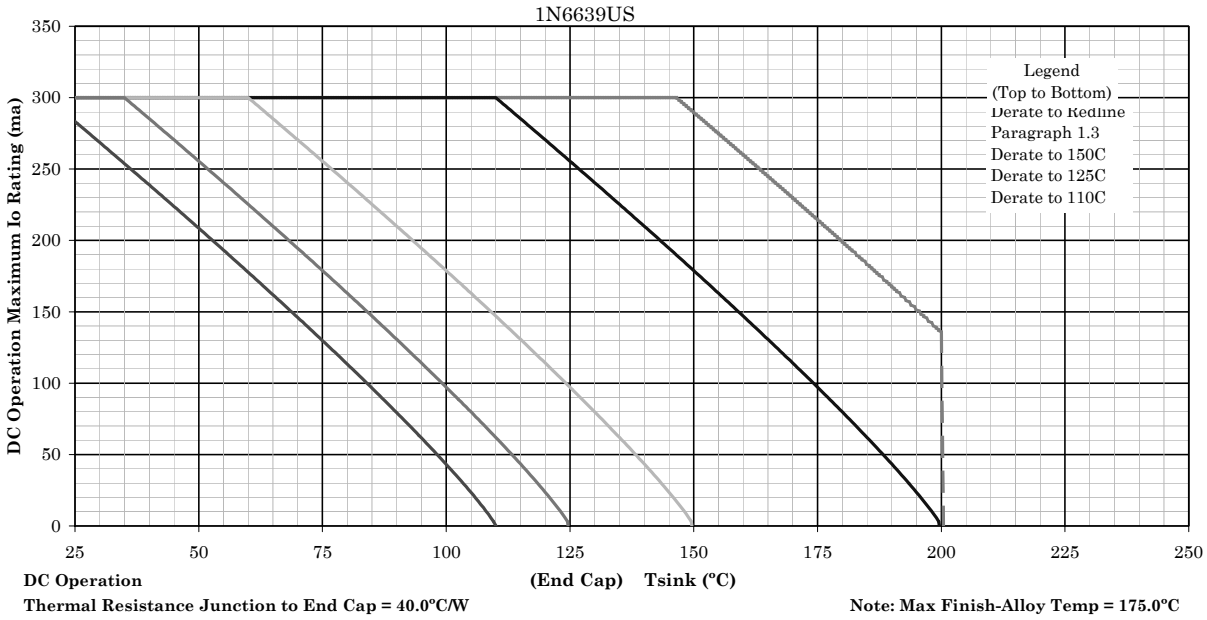


NOTES:

1. Maximum theoretical derate design curve. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at $\leq T_J$ specified on this curve. Any parallel line to this curve will intersect the appropriate power for the desired maximum T_J allowed.
2. Derate design curve constrained by the maximum junction temperatures and power rating specified. (See 1.3 herein.)
3. Derate design curve chosen at $T_J \leq 150^\circ C$, where the maximum temperature of electrical test is performed.
4. Derate design curve chosen at $T_J \leq 125^\circ C$, and $110^\circ C$ to show power rating where most users want to limit T_J in their application.

* FIGURE 4. Temperature current derating for 1N6639 (DO-35).

Temperature-Current Derating Curves

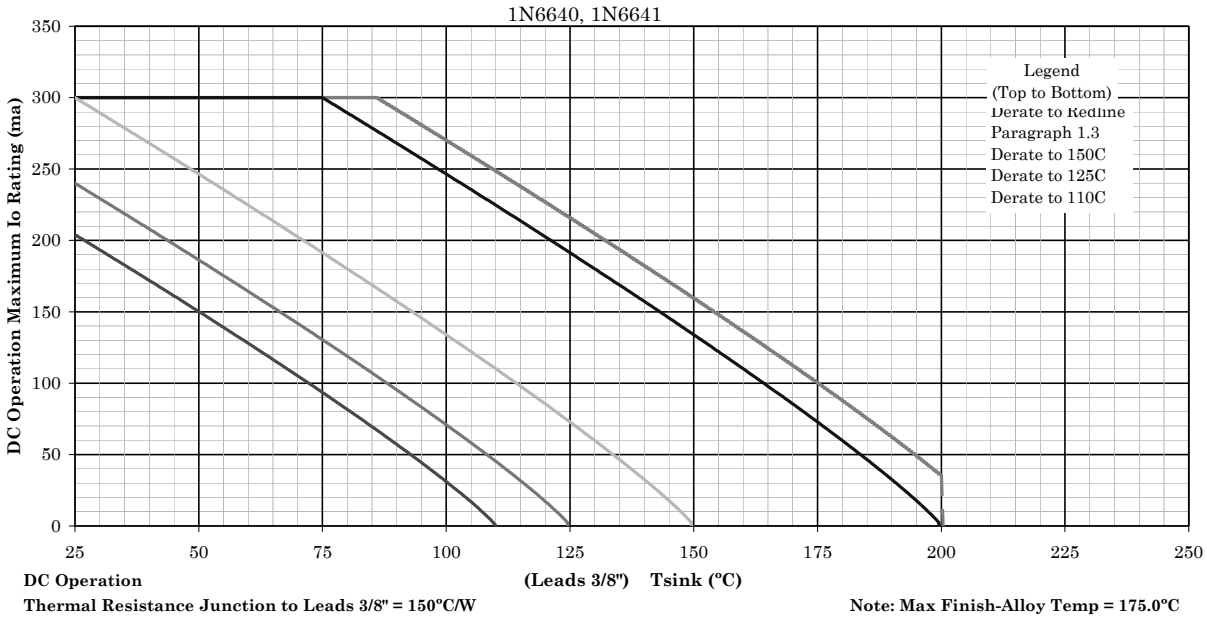


NOTES:

1. Maximum theoretical derate design curve. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at $\leq T_J$ specified on this curve. Any parallel line to this curve will intersect the appropriate power for the desired maximum T_J allowed.
2. Derate design curve constrained by the maximum junction temperatures and power rating specified. (See 1.3 herein.)
3. Derate design curve chosen at $T_J \leq 150°C$, where the maximum temperature of electrical test is performed.
4. Derate design curve chosen at $T_J \leq 125°C$, and 110°C to show power rating where most users want to limit T_J in their application.

* FIGURE 5. Temperature current derating for 1N6639US (D-5D).

Temperature-Current Derating Curves

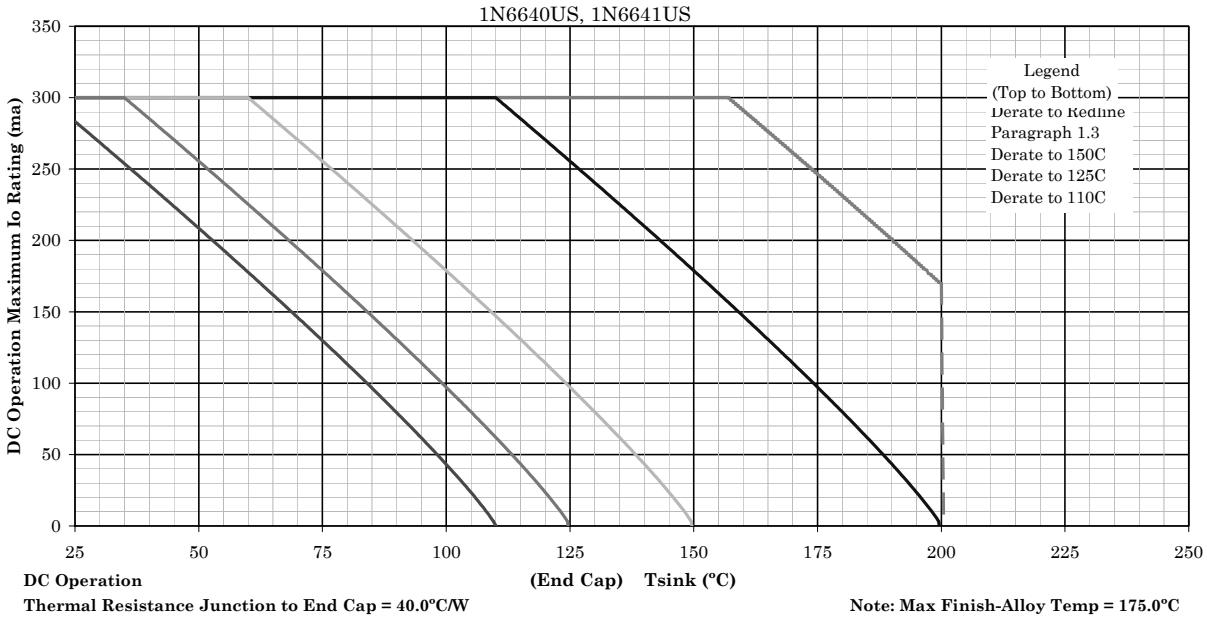


NOTES:

1. Maximum theoretical derate design curve. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at $\leq T_J$ specified on this curve. Any parallel line to this curve will intersect the appropriate power for the desired maximum T_J allowed.
2. Derate design curve constrained by the maximum junction temperatures and power rating specified. (See 1.3 herein.
3. Derate design curve chosen at $T_J \leq 150°C$, where the maximum temperature of electrical test is performed.
4. Derate design curve chosen at $T_J \leq 125°C$, and 110°C to show power rating where most users want to limit T_J in their application.

* FIGURE 6. Temperature current derating for 1N6640 and 1N6641 (DO-35).

Temperature-Current Derating Curves



NOTES:

1. Maximum theoretical derate design curve. This is the true inverse of the worst case thermal resistance value. All devices are capable of operating at $\leq T_J$ specified on this curve. Any parallel line to this curve will intersect the appropriate power for the desired maximum T_J allowed.
2. Derate design curve constrained by the maximum junction temperatures and power rating specified. (See 1.3 herein.)
3. Derate design curve chosen at $T_J \leq 150°C$, where the maximum temperature of electrical test is performed.
4. Derate design curve chosen at $T_J \leq 125°C$, and 110°C to show power rating where most users want to limit T_J in their application.

* FIGURE 7. Temperature current derating for 1N6640US and 1N6641US (D-5D).

5. PACKAGING

* 5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the Military Service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The notes specified in MIL-PRF-19500 are applicable to this specification.

* 6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. Packaging requirements (see 5.1).

c. Lead finish (see 3.4.1).

d. Product assurance level and type designator.

* 6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers' List (QML No. 19500) whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Defense Supply Center Columbus, DSCC-VQE, P.O. Box 3990, Columbus, OH 43216-5000, or e-mail vqe.chief@dla.mil.

6.4 Substitution information. The 1N6640 (MIL-PRF-19500/609) is preferred type in lieu of the 1N4150 and 1N4150-1 (MIL-PRF-19500/231).

6.4.1 Cross reference substitution list. JANS level will no longer be built to MIL-PRF-19500/231. Devices in stock are acceptable provided the date code does not exceed 23 March 1994 (the date of implementation of MIL-S-19500/231F). The devices on this specification are required for space flight applications. A PIN for PIN replacement table follows, and these devices are directly interchangeable.

Non-preferred PIN	Preferred PIN
1N4150-1	1N6640

* 6.5 Changes from previous issue. The margins of this specification are marked with asterisks to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:
Army - CR
Navy - EC
Air Force - 11
NASA - NA
DLA - CC

Review activities:
Army - AR, MI, SM
Navy - AS, MC
Air Force - 19, 71

Preparing activity:
DLA - CC

(Project 5961-2720)

* NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at www.dodssp.daps.mil.